REMARKS

Claims 1-16, 31, 32, and 39-42 are pending. By this Amendment, claims 1-16, 31, 32, and 39-42 are canceled and claims 43-57 are added. Entry of the new claims and reconsideration and allowance of the present application based on the following remarks are respectfully requested.

Objections to Specification and Drawings

In the Office Action, the specification was objected to, stating that a new title was required. Applicants respectfully submit that, by this Amendment, the title is changed to be more clearly indicative of the claimed invention.

Additionally in the Office Action, the drawings were objected to for failing to show every feature of the invention as specified in the claims. Applicants respectfully submit that the drawings include all features recited in new claims 43-57. Further, as instructed by the Examiner, Figures 1A and 1B have been corrected in an accompanying Drawing Change Authorization Request (filed herewith) to include legends indicating that those drawings show prior art subject matter. In addition, Figures 2A-2D, 4, 6A, 6B, 6D-6G, 6I-6K, 7A, and 8A have been corrected in an accompanying Drawing Change Authorization Request to show cross-hatching of layers in respective sectional views. Figures 3D and 6C have been replaced with new Figures 3D and 6C by the Drawing Change Authorization Request. Applicants note that the Office Action objects to Figures 9A-9D based on the "insulative" and "conductive" layers not being cross-hatched. Applicants respectfully submit that Figures 9A-9D represent an alternative process for forming the resilient contact element of the present invention by showing a mold (901) and a deformable material (903) deposited on a substrate (905). All features in Figures 9A-9D are shown in section and are cross-hatched accordingly. Applicants respectfully submit that the drawings and specification are in good form for allowance.

Section 112 Rejections

Claims 3-5, 32, and 41-42 have been rejected by the Office Action under 35 U.S.C. §112, first paragraph, as containing subject matter not described in the specification. Applicants respectfully submit that claims 3-5, 32, and 41-42 have been canceled, by this Amendment, and as such, the rejection of these claims under §112, first paragraph, is moot. Further, Applicants respectfully submit that new claims 43-57 are in good form for allowance, with respect to §112, first paragraph.

Claims 1-16, 31-32, and 39-42 have been rejected under 35 U.S.C. §112, second paragraph, as being indefinite. Applicants respectfully submit that claims 1-16, 31-32, and 39-42 have been canceled, by this Amendment and as such, the rejection of these claims under §112, second paragraph, is moot. Further, Applicants respectfully submit that new claims 43-57 are in good form for allowance, with respect to §112, second paragraph.

Art-Based Rejections

Claims 1, 6-16, 31, 39, and 40 have been rejected under 35 U.S.C. §102(e) as being anticipated by Smith et al. Applicants respectfully submit that claims 1, 6-16, 31, 39, and 40 have been canceled and therefore the rejection of these claims under §102(e) is moot.

Claim 2 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Smith et al. Applicants respectfully submit that claim 2 has been canceled and therefore the rejection of this claim under §103(a) is moot.

Applicants respectfully submit that independent claims 43 and 50 recite an interconnect assembly and an electrical system, respectively, that have a resilient contact element formed on an outwardly facing surface of a substrate. The resilient contact element is formed by depositing a insulative material on the outwardly facing surface, except for the bond pad, and forming a trace of at least one conductive material over the insulative material, in communication with the bond pad. A sacrificial material is deposited on the insulative material and then a resilient material and a conductive material are plated, consecutively, on the sacrificial material in communication with the trace. The sacrificial material is then removed such that a portion of the plated resilient and conductive materials are spaced from the outwardly facing surface.

Smith et al. discloses a spring contact that is photolithographically formed on a substrate. The formation of the spring contact of Smith includes first forming a release layer on the substrate adjacent a bond pad. Then a metal layer is formed by sub-layering a metallic material over the release layer and the bond pad. The sub-layering includes depositing the metallic material in five deposition increments (see col. 6, lines 48-49). Each deposition includes sputter-depositing a metal onto the previously formed sub-layers. In order to impart a spring characteristic to the metal layer, material of each sub-layer has a stress magnitude introduced thereto upon deposition. The stress magnitudes in the sub-layers may be manipulated by changing the pressure of a plasma gas (see col. 6, lines 36-39). A positive photosensitive resist is then formed on top of the metal layer and then patterned. Exposed

areas of the metal layer are then removed by etching (see col. 7, lines 5-15). The release layer is then removed by under-cut etching so that the portion of the metal layer previously affixed thereto is moved away from the substrate due to the stress gradient in the metal layer (in the form of incremental stress variations in the sub-layers). The spring contact must then undergo a post heating annealing process to relieve stress in the portion of the spring contact mounted to the bond pad to prevent the spring contact from pulling away from the bond pad (see col. 8, lines 16-18 and 21-25). A gold layer may be formed over the metal layer to provide good conductivity.

Applicants respectfully submit that the resilient contact element, as recited in claims 43-57, present significant advantages over the spring contact of Smith and is not anticipated by Smith. For example, the process by Smith of introducing a stress gradient into the metal layer is complex and time-consuming, since the metal layer must be formed in numerous relatively thin sub-layers and the pressure of the plasma gas must be altered for each deposition of sub-layer. Conversely, the resilient contact element, as recited in independent claims 43 and 50, may be formed with only a resilient layer and a conductive layer, each of which are formed by plating (the resilient layer being plated on the sacrificial material and the conductive layer being plated on the resilient layer). As such, the resilient contact element recited in claims 43 and 50 may be formed much more simply and in less time relative to the spring contact of Smith.

Further, a height of the spring contact of Smith is determined by a deflection the contact undergoes once separated from the release layer. In other words, the distance between the spring contact and the substrate is determined by the amount (the distance) the spring contact curls away from the substrate. The curvature of the spring contact depends on the thickness of the metal layer (dependent upon individual thicknesses of respective sub-layers), uniformity of material of the sub-layers (effects the properties of the metal layer, including the Young's modulus), and the accuracy of the stress gradient of the metal layer (dependent on stress concentrations within the sub-layers) (see col. 5, lines 56-67). As such, there may be a greater likelihood of height deviation between respective spring contacts for substrates having a series of spring contacts, according to Smith. The resilient contact element as recited in claims 43 and 50 may have a reduced likelihood of height deviation, since the height of the resilient contact element is dependent only upon the height of the sacrificial layer and the thickness of the plated resilient and conductive materials. As such, the resilient contact element, as claimed, may be formed with greater accuracy than the spring contact of Smith.

Additionally, Smith discloses post heat treating (annealing) the spring contact to relieve stress in an anchor portion of the spring contact to prevent the spring contact from pulling away from the bond pad. However, exposing the spring contact to heat of a sufficiently high temperature for a sufficiently long duration to effect annealing of the anchor portion, may cause heat damage to other exposed components. Conversely, the resilient contact element, as recited in claims 43 and 50, requires no such post heat treatment to relieve residual stress, since the resilient contact element is formed by plating.

In light of the foregoing remarks, Applicants respectfully submit that claims 43-57 are not anticipated by Smith et al. Further, since Smith et al. does not teach or suggest forming a resilient contact element including plating a resilient layer and a conductive layer on a sacrificial layer, Smith et al. cannot be used as a basis for a case of obviousness.

In view of the foregoing, the claims are believed to be in form for allowance, and such action is hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, he is kindly requested to contact the undersigned at the telephone number listed below.

Attached hereto is a marked-up version of the changes made to the specification. The attached Appendix is captioned **"Version with markings to show changes made"**.

All objections and rejections having been addressed, it is respectfully submitted that the present application is in a condition for allowance and a Notice to that effect is earnestly solicited.

Respectfully submitted,

Pillsbury Winthrop LLP

By: _____

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Ninth Floor
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(202) 861-3000
Enclosure: Appendix

APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE TITLE:

The title is changed as follows:

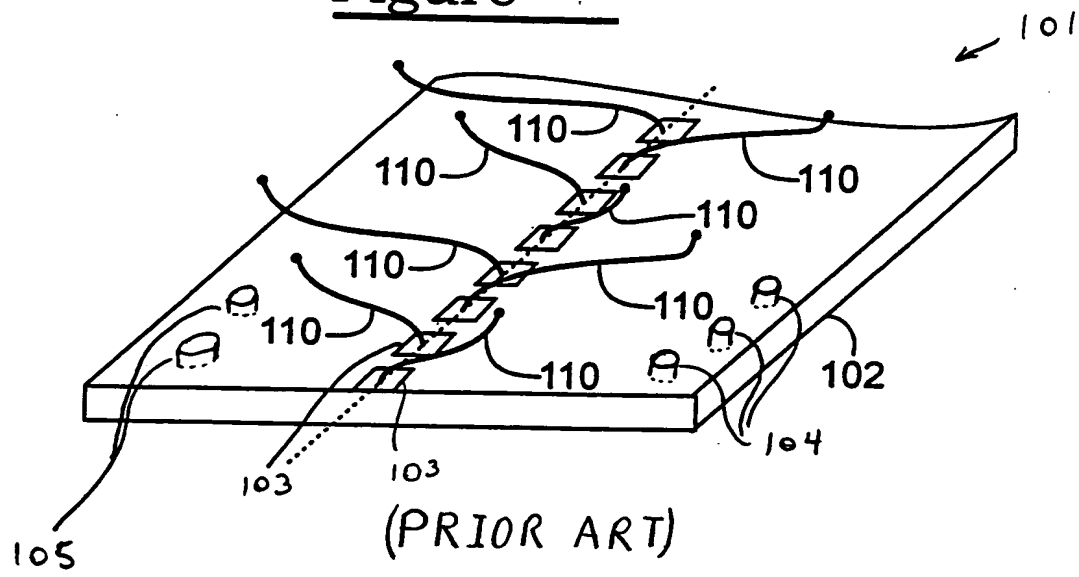
INTERCONNECT ASSEMBLIES[AND METHODS]

IN THE CLAIMS:

Claims 43-57 have been added.

END OF APPENDIX

Figure 1A



(PRIOR ART)

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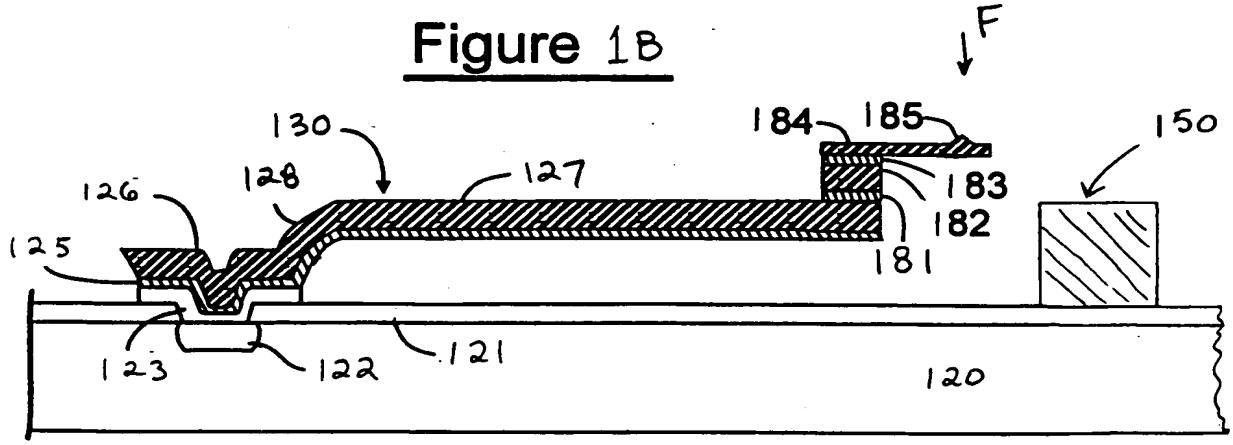
Figure 1B



(PRIOR ART)

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FIG. 2A

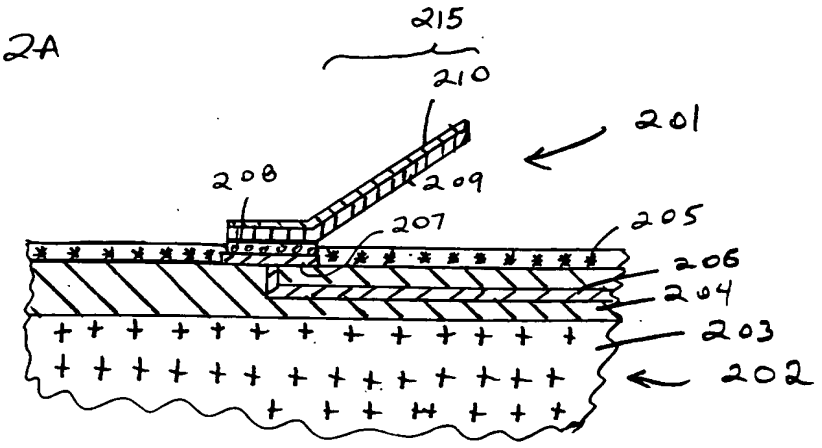

FIG. 2B

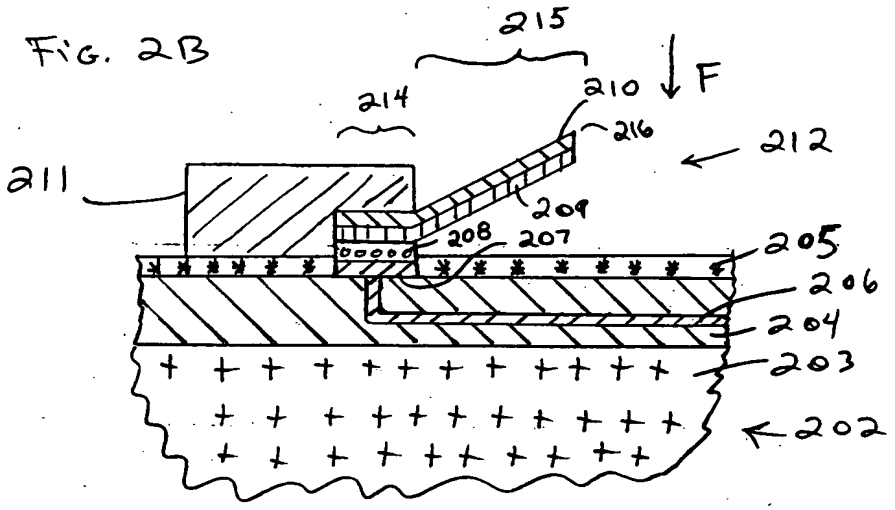

FIG. 2C

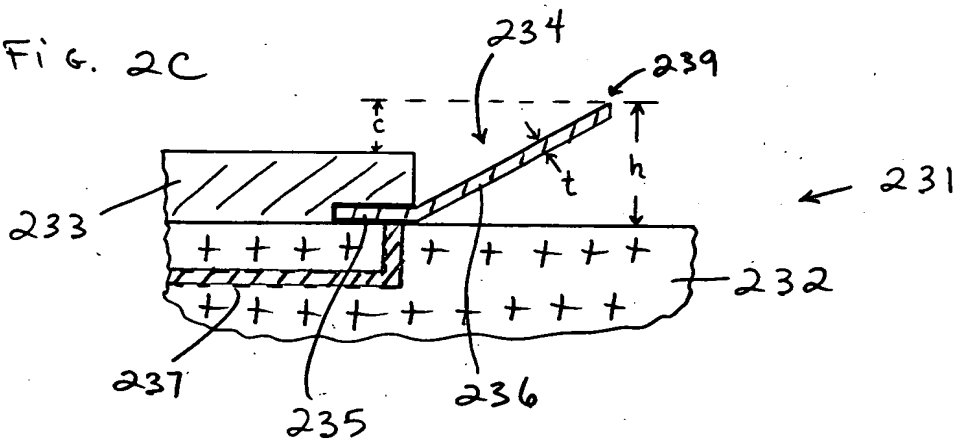

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Fig. 2D

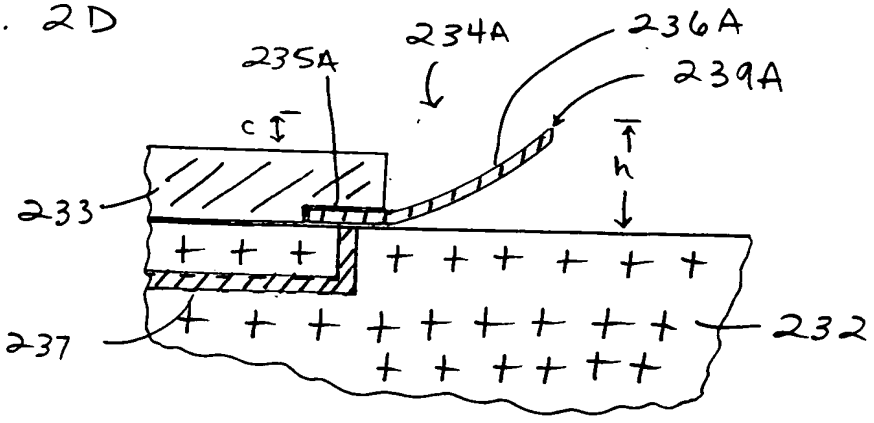

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Fig. 2E

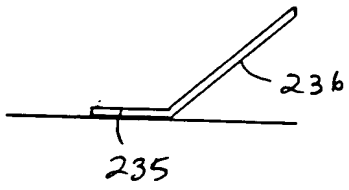

Fig. 2F

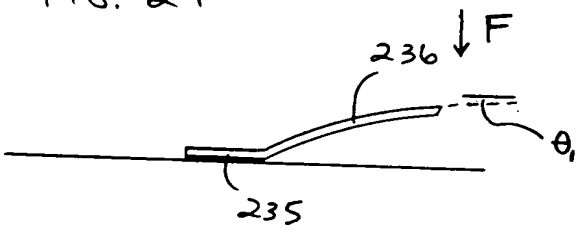

Fig. 2G

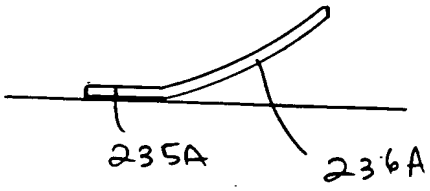

Fig. 2 H

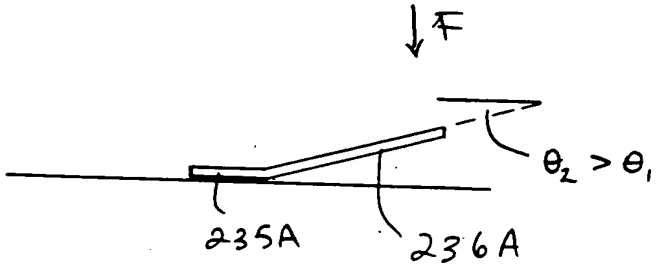

FIG. 3A

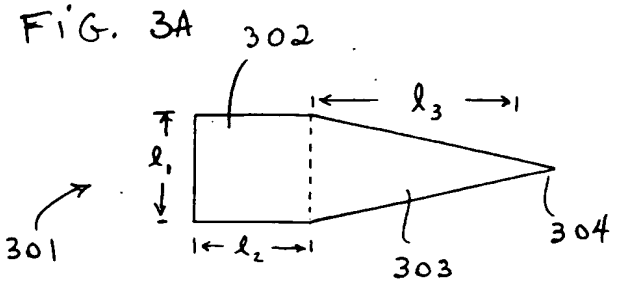

FIG. 3B

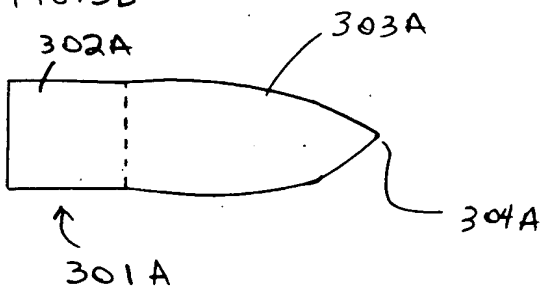

FIG. 4

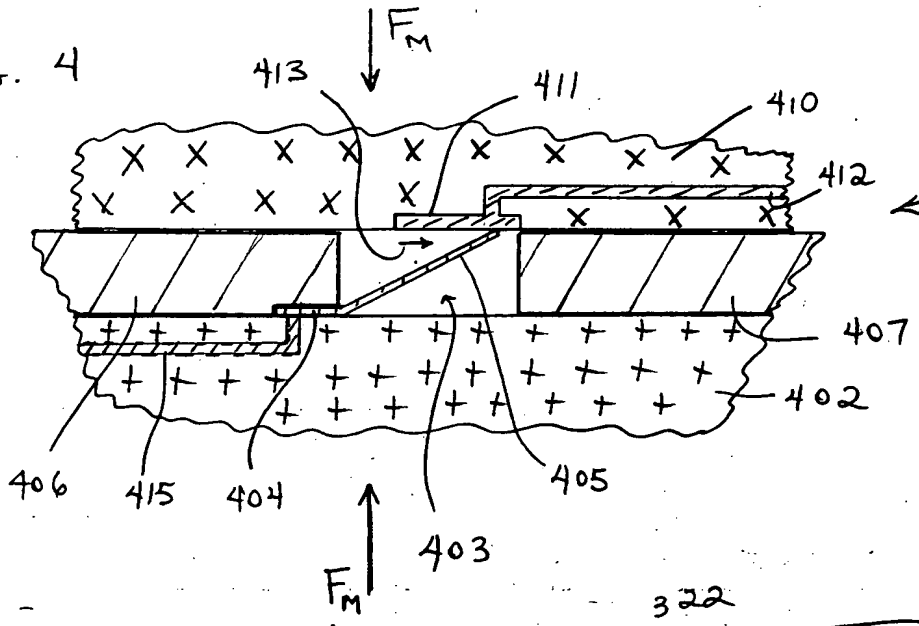

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FIG. 3C

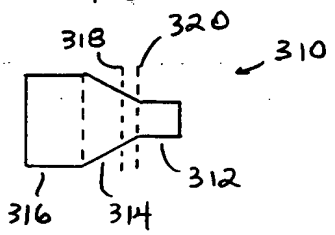


FIG. 3D

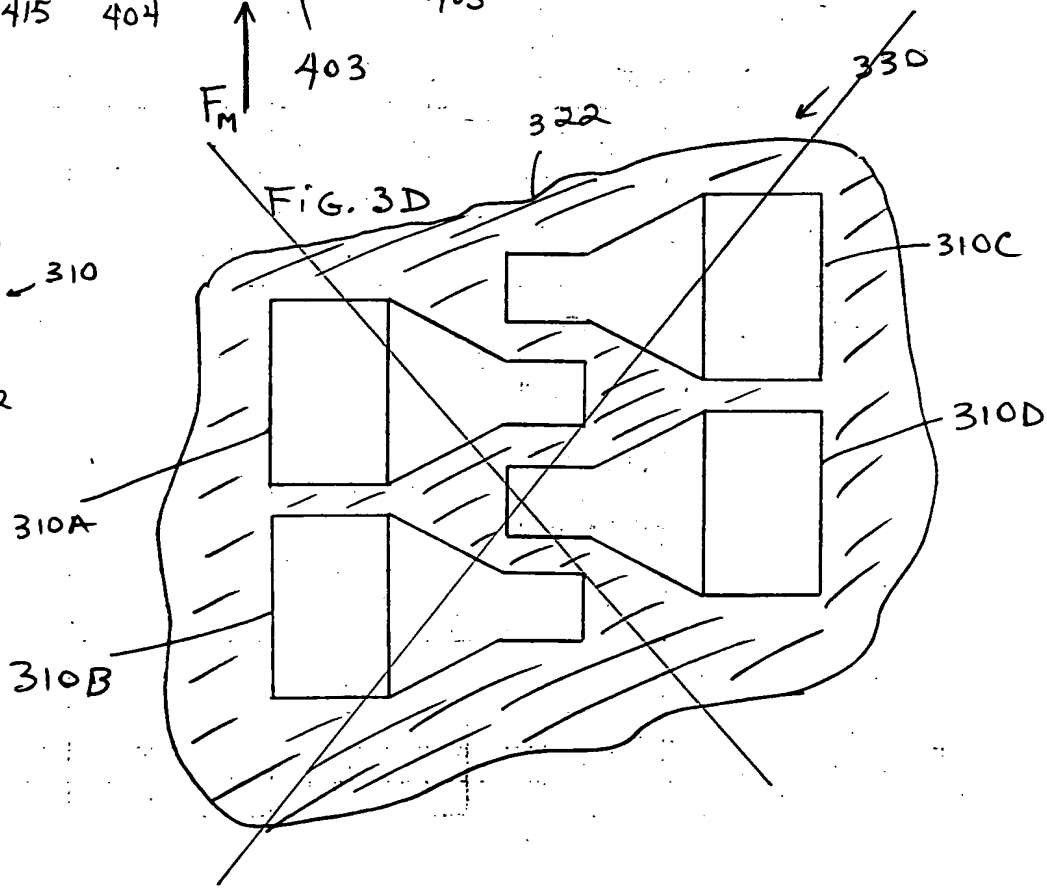


FIG. 6A

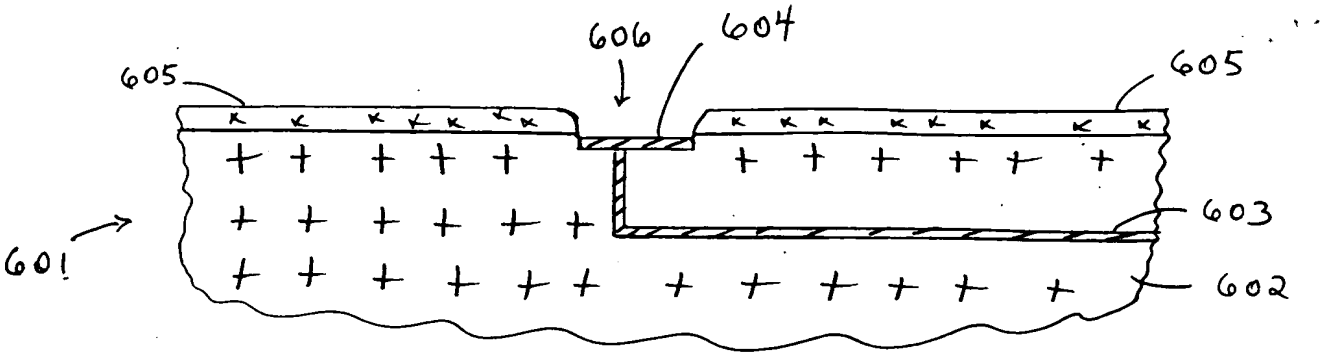


FIG. 6B

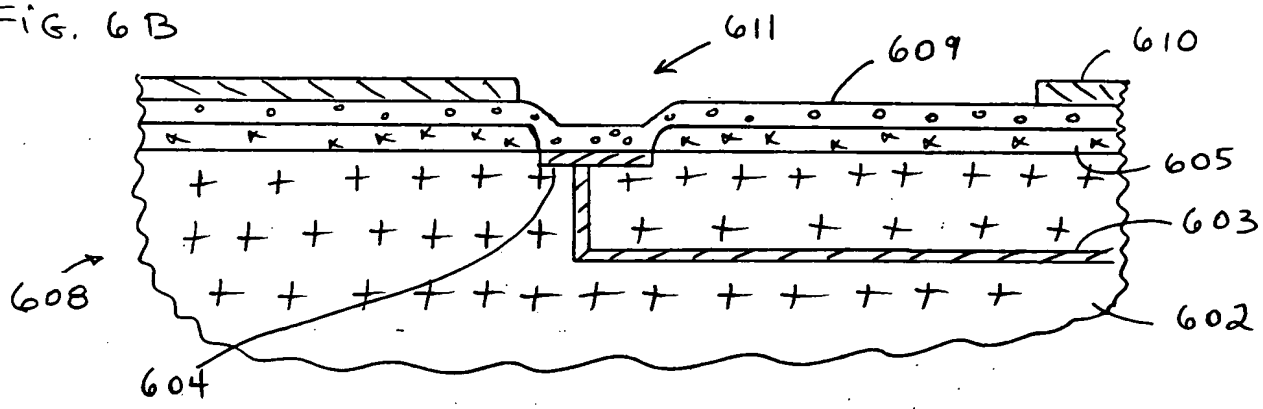


FIG. 6C

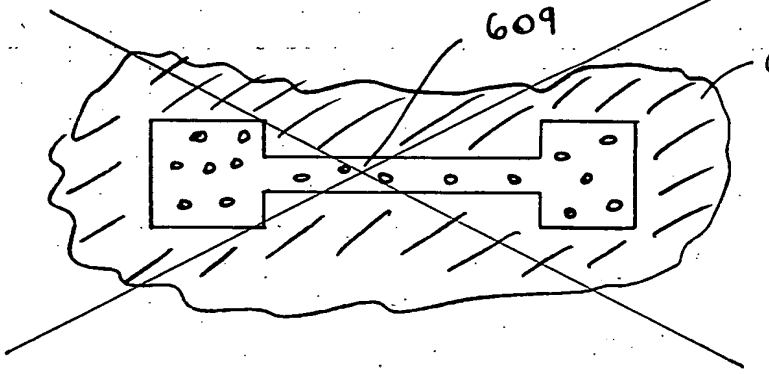
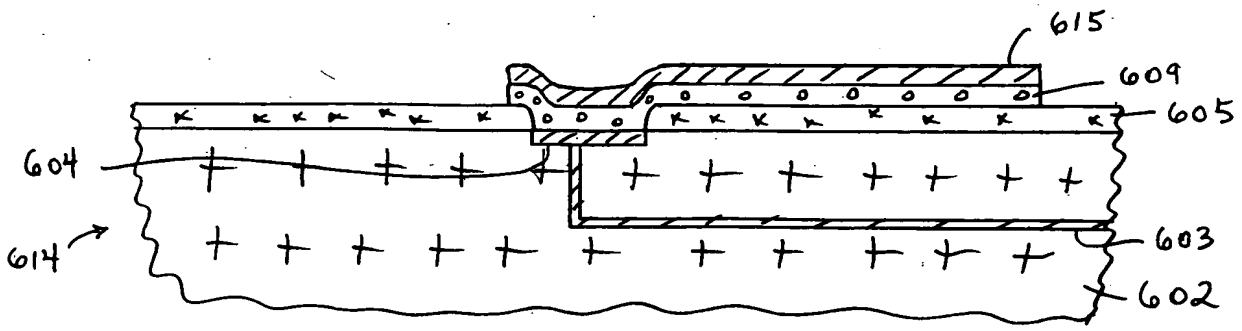


FIG. 6D



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SN

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SN

FIG. 6E

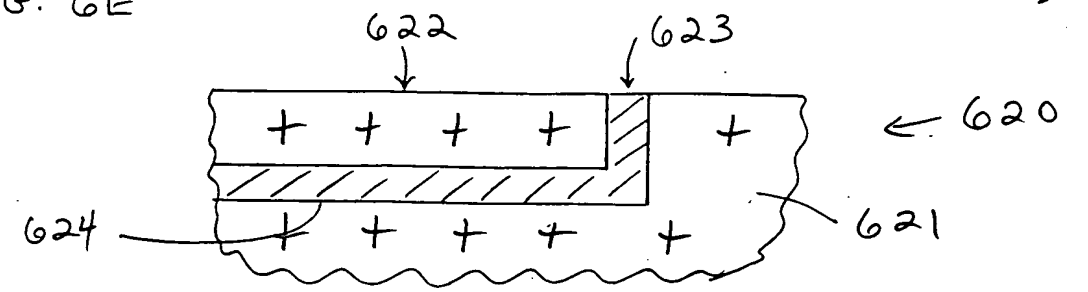

FIG. 6F

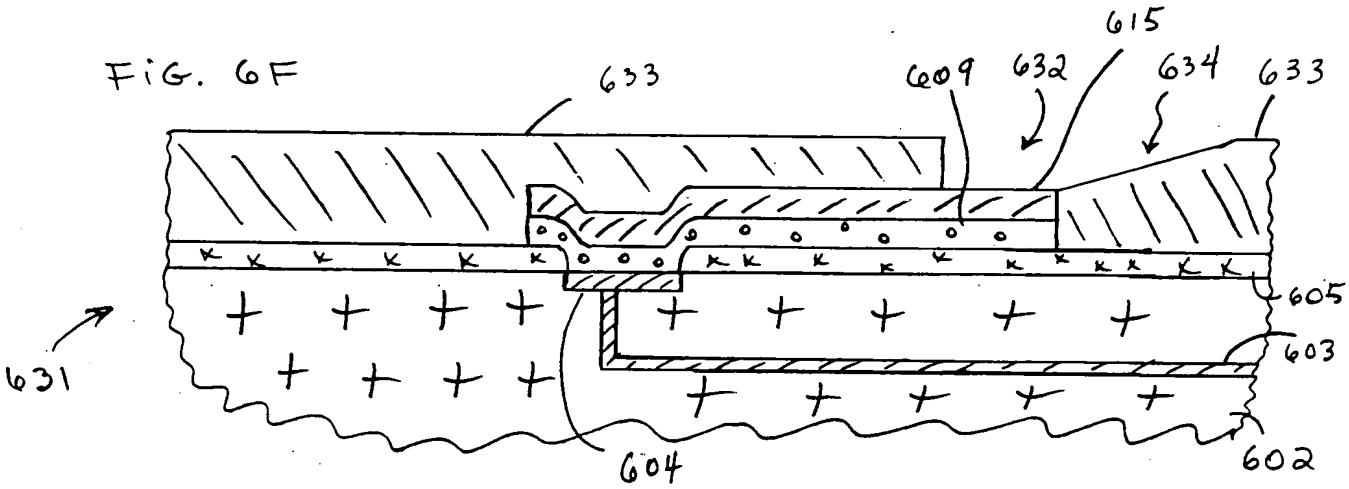

FIG. 6G

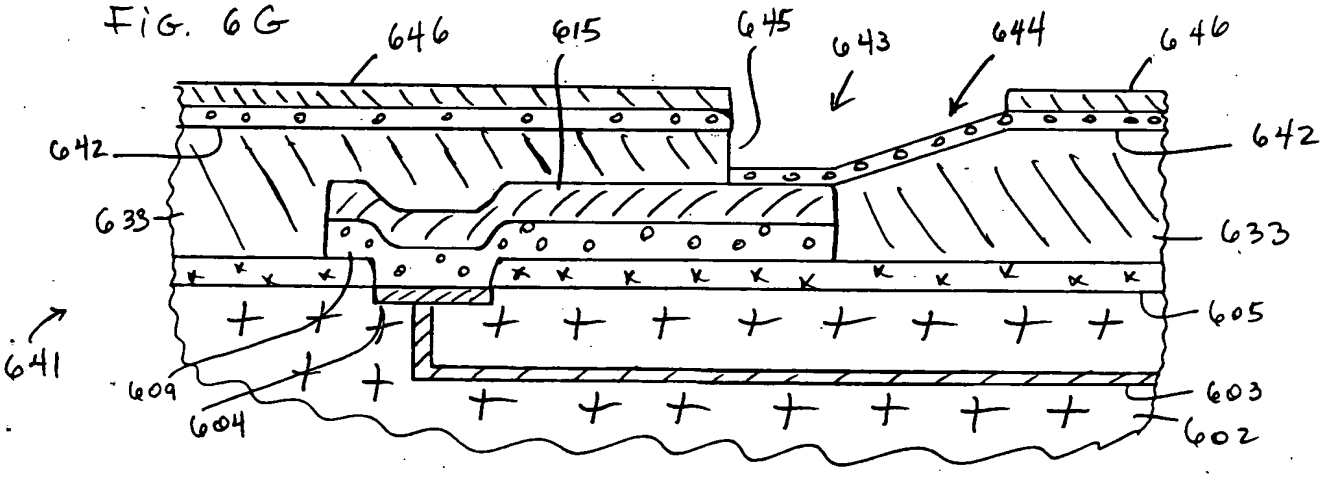

FIG. 6H

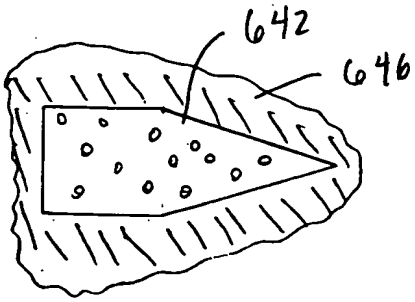

FIG. 6I

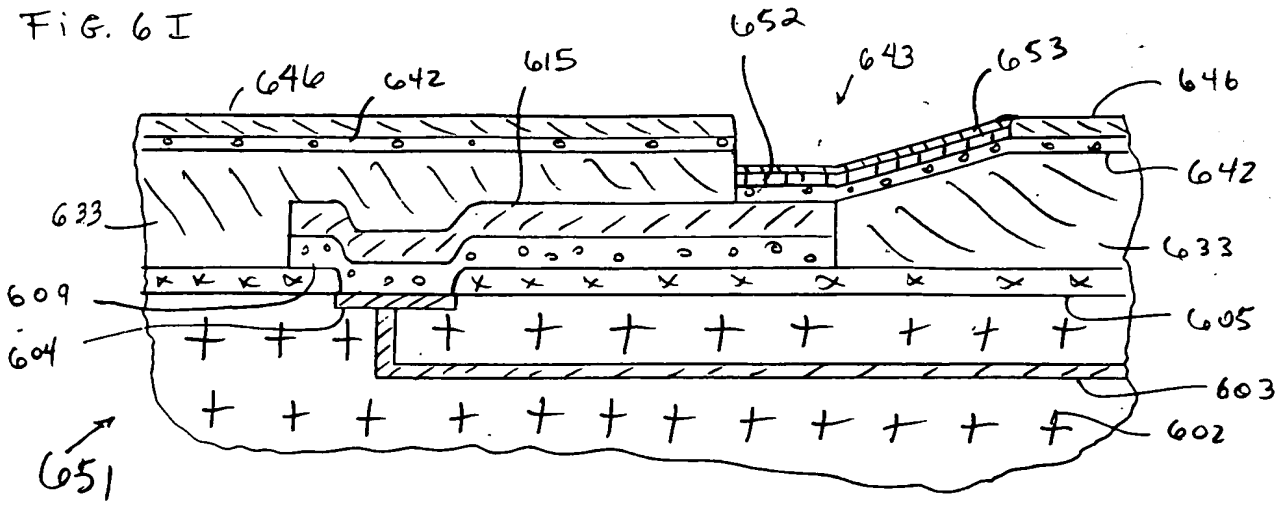

FIG. 6J

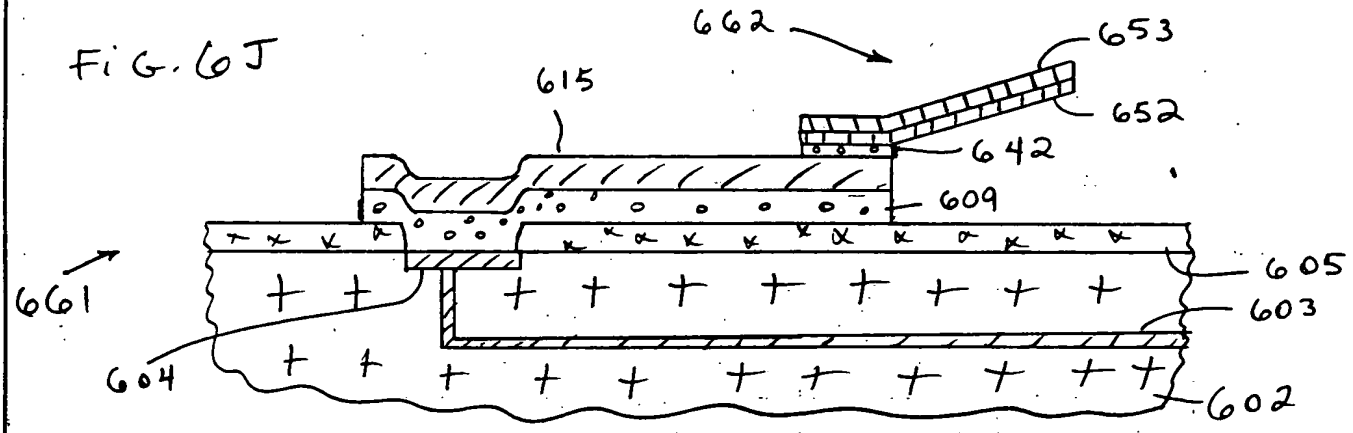

FIG. 6K

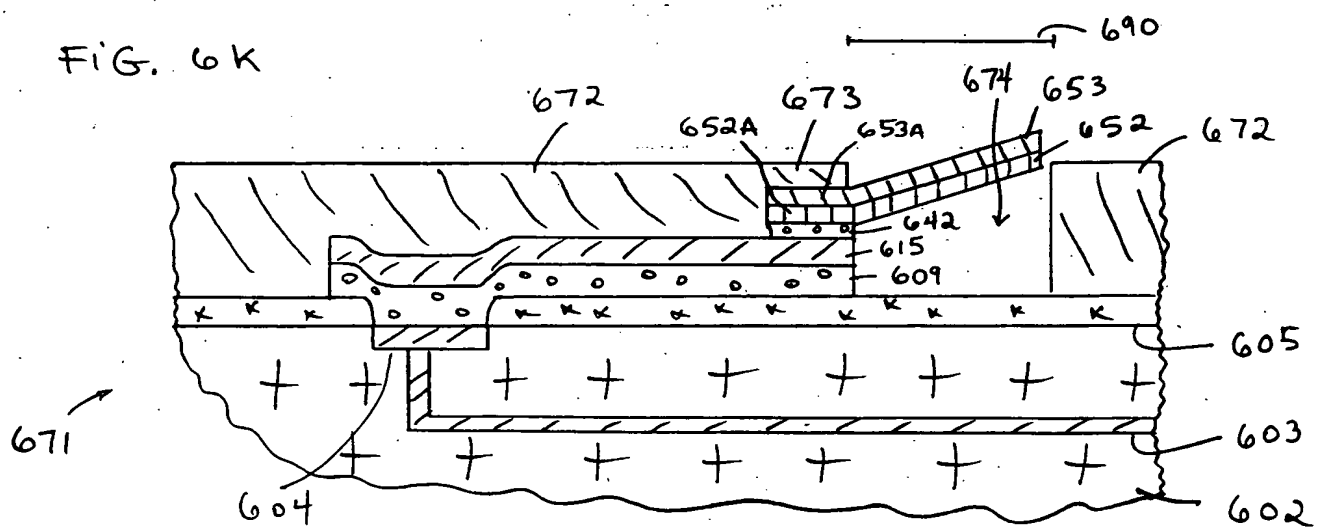

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FIG. 6L

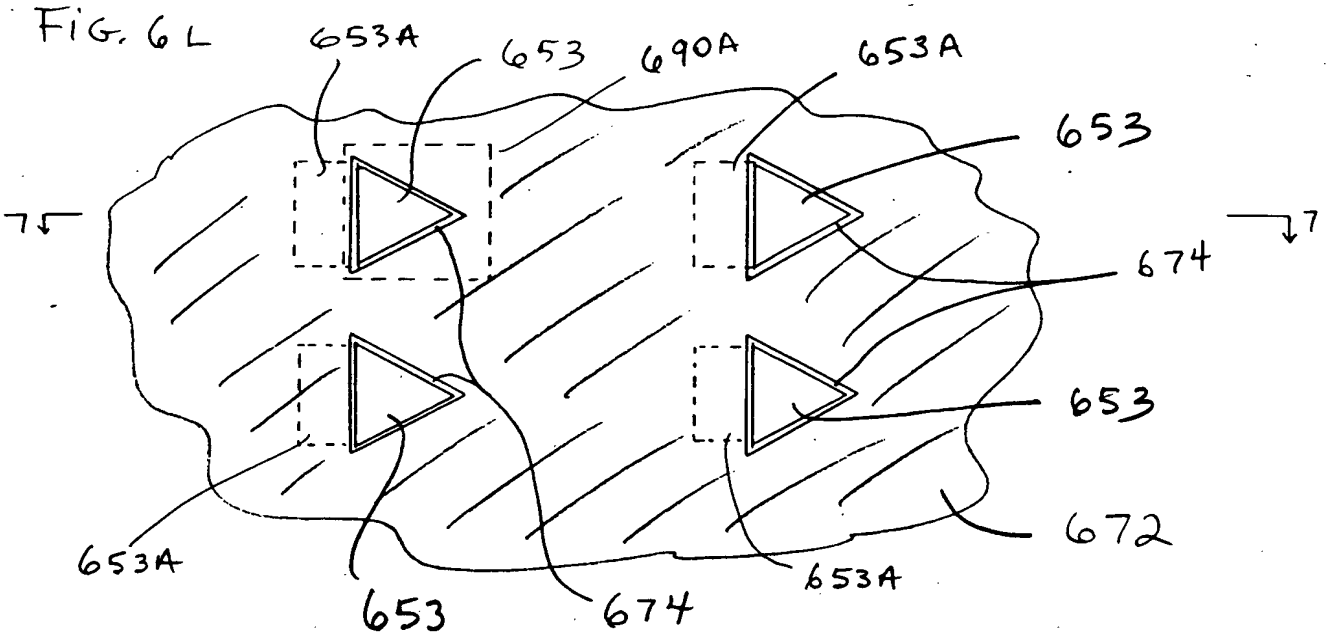

FIG. 7A

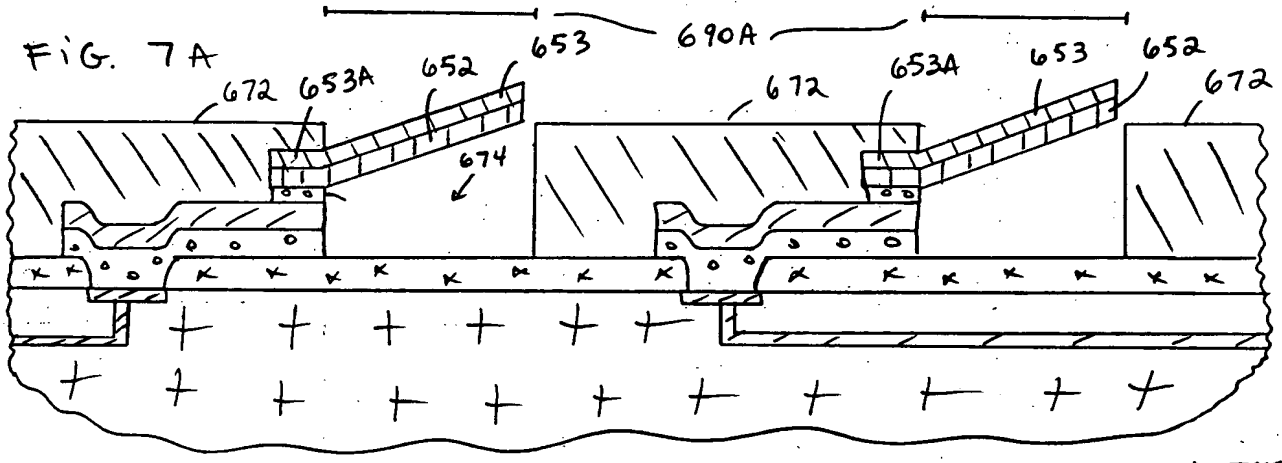

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FIG. 7B

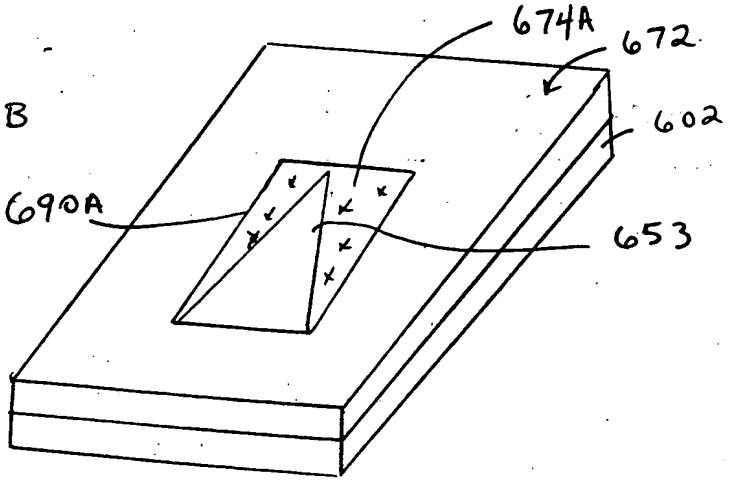

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FIG. 8A

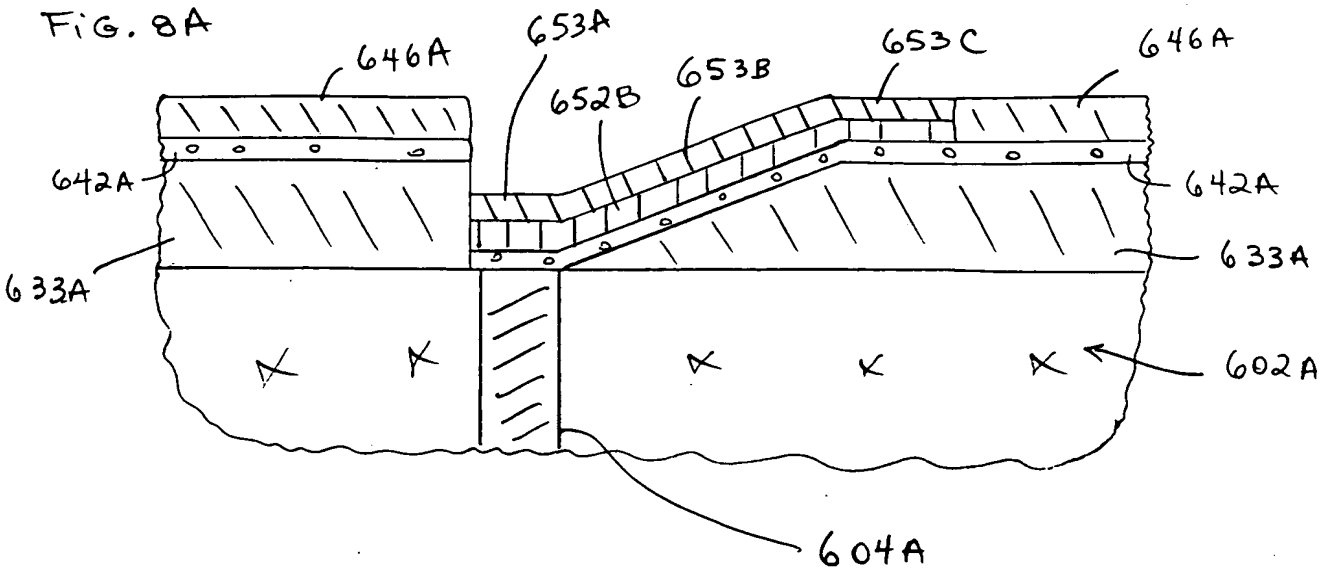
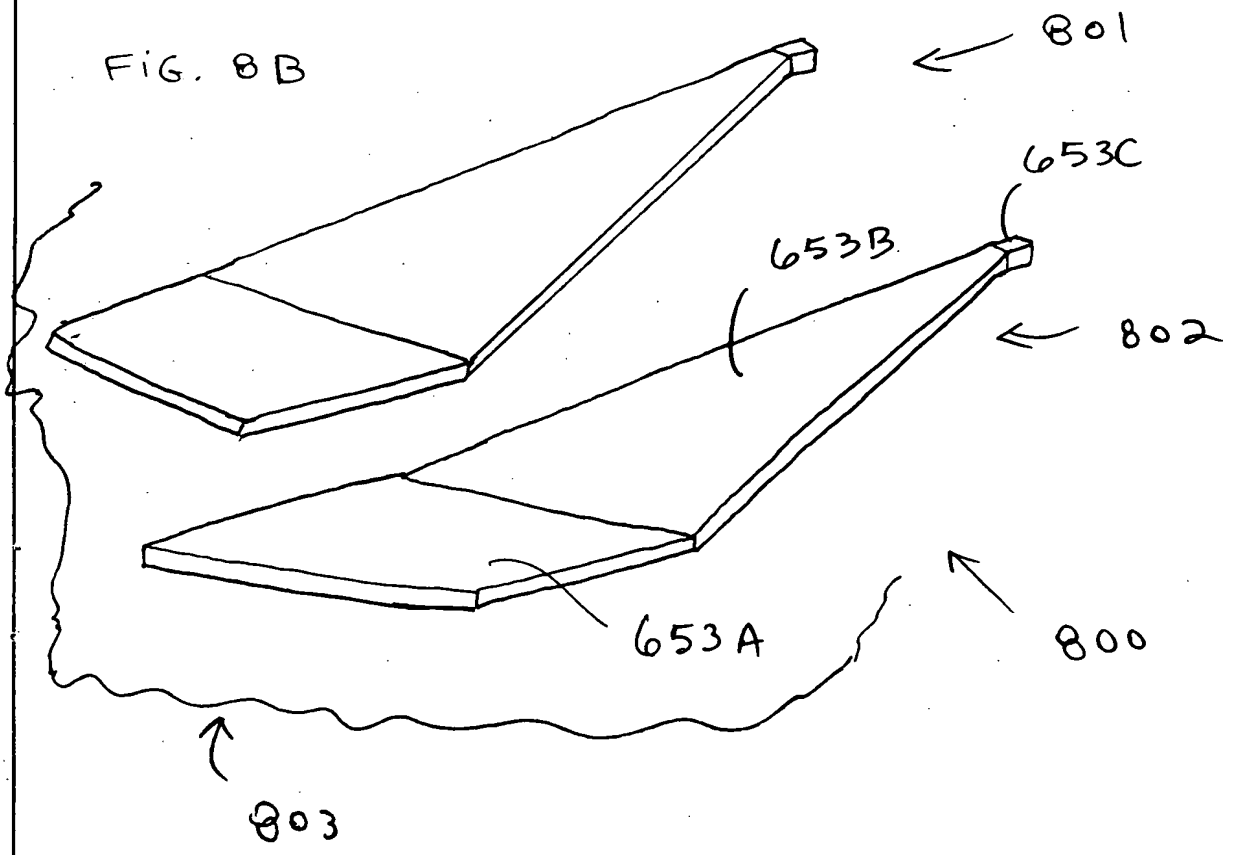


FIG. 8B



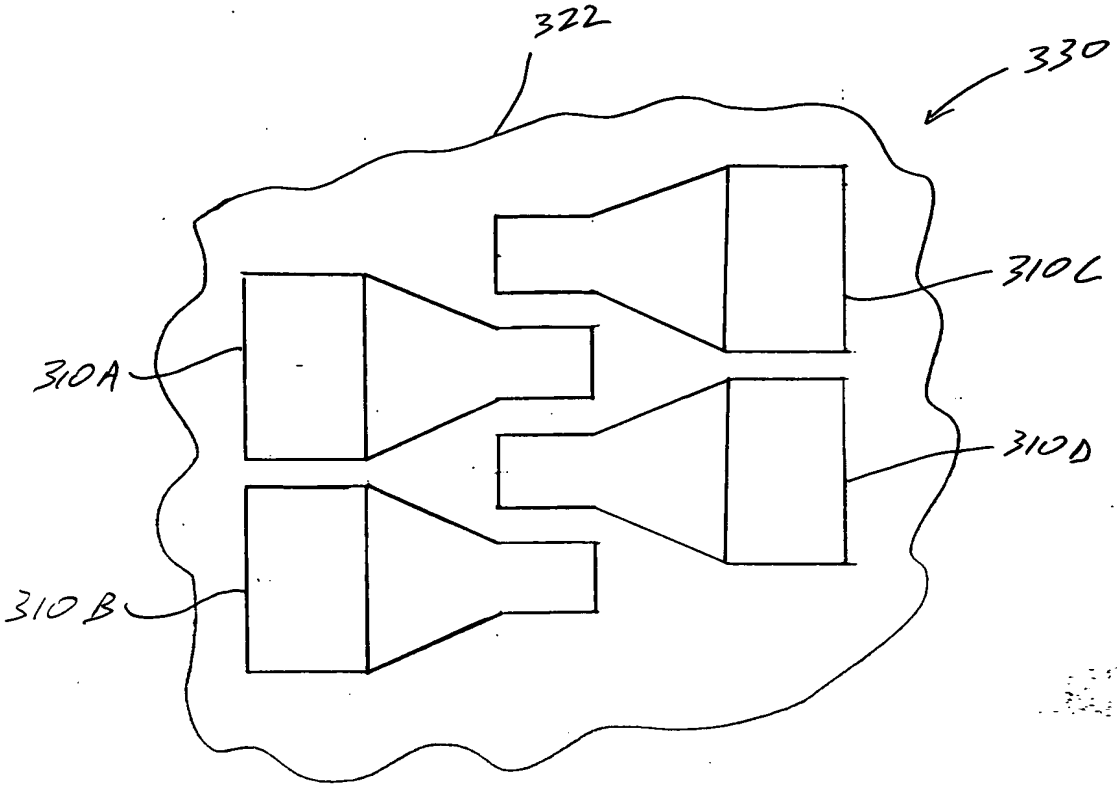


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Fig. 3D

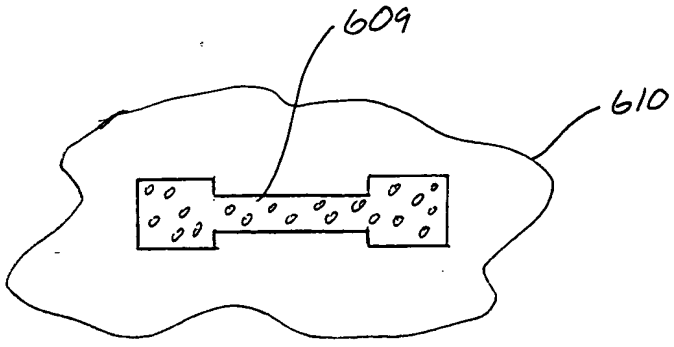

Fig. 6C

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